

<http://www.ncbi.nlm.nih.gov/pubmed/23160082> PEER REVIEWED REPORT

Cancer mortality in towns in the vicinity of incinerators and installations for the recovery or disposal of hazardous waste.

García-Pérez J, Fernández-Navarro P, Castelló A, López-Cima MF, Ramis R, Boldo E, López-Abente G.

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Abstract BACKGROUND:

Waste treatment plants release toxic emissions into the environment which affect neighboring towns.

OBJECTIVES:

To investigate whether there might be excess cancer mortality in towns situated in the vicinity of Spanish-based incinerators and installations for the recovery or disposal of hazardous waste, according to the different categories of industrial activity.

METHODS:

An ecologic study was designed to examine municipal mortality due to 33 types of cancer, across the period 1997-2006. Population exposure to pollution was estimated on the basis of distance from town of residence to pollution source. Using Besag-York-Mollié (BYM) regression models with Integrated Nested Laplace approximations for Bayesian inference, and Mixed Poisson regression models, we assessed the risk of dying from cancer in a 5-kilometer zone around installations, analyzed the effect of category of industrial activity, and conducted individual analyses within a 50-kilometer radius of each installation.

RESULTS:

Excess cancer mortality (BYM model: relative risk, 95% credible interval) was detected in the total population residing in the vicinity of these installations as a whole (1.06, 1.04-1.09), and, principally, in the vicinity of incinerators (1.09, 1.01-1.18) and scrap metal/end-of-life vehicle handling facilities, in particular (1.04, 1.00-1.09). Special mention should be made of the results for tumors of the pleura (1.71, 1.34-2.14), stomach (1.18, 1.10-1.27), liver (1.18, 1.06-1.30), kidney (1.14, 1.04-1.23), ovary (1.14, 1.05-1.23), lung (1.10, 1.05-1.15), leukemia (1.10, 1.03-1.17), colon-rectum (1.08, 1.03-1.13) and bladder (1.08, 1.01-1.16) in the vicinity of all such installations.

CONCLUSIONS:

Our results support the hypothesis of a statistically significant increase in the risk of dying from cancer in towns near incinerators and installations for the recovery or disposal of hazardous waste. Copyright © 2012 Elsevier Ltd. All rights reserved.

http://www.gainscotland.org.uk/feature_Sint-Niklaas.shtml

The story of the Sint-Niklaas (Belgium) waste incinerator - 1977-2009

by Fred De Baere, Flemish platform health and environment

The incinerator operated since 1977. Neighbours found a lot of diseases by themselves, which was confirmed in a health impact report in 1998.

http://www.milieugezondheid.be/Report_health_impact_Belgian_MIWA_waste_incinerator.pdf

Mispelstraat: living under the smoke of a waste incinerator

Report on the health impact of the MIWA-waste incinerator in Sint-Niklaas Belgium

9 boys out of 10 between 2 and 9 years old have 1 or more complaints : mis-dividing of embryonic cells, hyperactivity, light mental defectiveness, colds, bronchitis, dust allergy, skin allergy, allergy to cow's milk, non-closing stomach valve, stenosis of the gastric exit, breathing disturbances, diarrhoea, infections of the bronchial tubes, asthma, motoric disturbances, polyps, other allergies

The deceased females had an average of 59.9 years (the average age in case of deceased age of Belgium female is 77.7 years), the deceased male rate had an average decease age of 64.7 years (the average decease age of Belgium males is 71.3 years).

For the group of 145 inhabitants of "Medlarstreet" living there from before 1978, the change of cancer occurrence has for the last 3 years increased to **4.8 times more than** the Belgian average.

Very striking is the increasing link to cancer occurrences. While in the period of 1986-1988 the cancer occurrence was more or less equal to normal occurrence expectations, during the period of 1995-1997 the occurrence was 4.8 times more than the normal occurrence expectations.

So some neighbours went to the court. On the 20th November 2001 the court of appeal decided that the incinerator had to be **closed at least on the end of 2002** based on the precaution principle, for example the managers refused to install a denox filter. And so this happened.

http://www.milieugezondheid.be/Juridisch/MIWA_eindarrest_011120.htm unfortunately in the Dutch language.

And finally, on the 30th October 2009 the criminal court **condemned the president and his two directors to be guilty to violating a lot of environmental and exploitation laws**. The president and his two directors where **condemned to pay 1,765,50 Euro to each civil party**. <http://www.milieugezondheid.be/Juridisch/091030arrestmiwa.pdf> as well in the Dutch language. Fred De Baere Flemish platform health and environment info@milieugezondheid.be

<http://myweb.tiscali.co.uk/freeblackpark/sain/children.htm>

Incinerators: The Effect on Children

By Dr J Thompson <http://www.slough.info/sain/sain02/sain02thompson04.html>

The report on the Sint Niklaas incinerator states "we have dedicated this report to all the deceased children who died from cancer as well as the numerous children who have numerous serious health complaints caused by the waste incinerator in Sint Niklaas. A society that does not take care of its children is less than primitive.

This report, **funded by the Belgian government**, is the only complete study ever done on incinerators. Although the proposed incinerator at Colnbrook will have a lower dioxin output than that at Sint Niklaas, the fact that it would be nine times larger, will emit higher volumes of particulates and will foolishly be allowed to incinerate radioactive material gives little cause for comfort.

Children are more vulnerable to the pollutants produced by incinerators, breathing in more air than adults relative to their size, and are likely to be the first to suffer from adverse effects. The foetus and newborn are uniquely vulnerable (see below).

Cancer

The report on the Sint Niklaas incinerator **showed that blood and glandular cancers appeared in children about 5 years after the incinerator started operating. This preceded the increase in adult cancers by 7 years. Adults cancers showed a five-fold increase over 20 years.** Knox found a doubling of childhood cancers and leukaemias within 5km of municipal incinerators (2) greatly exceeding the risk around non-combustion urban sites.

Congenital Abnormalities

A recent large study by Dummer over a 37 year period showed that the incidence of spina bifida was 17% higher and heart defects 12% higher near incinerators (3). Congenital defects of many kinds were found at Sint Niklass (1). **Orofacial defects were found to be more than doubled near an incinerator at Zeeberg, Amsterdam** (4). Dolk found a **33% higher incidence of birth defects, (86% higher neural tube defects, 50% higher incidence of cardiac septal defects) and a higher risk of chromosomal abnormalities within 3 km of municipal waste sites** (5). The same pattern of increased congenital defects (12%) with a higher excess of neural tube defects (54%) was found in a study of ethnic minorities near waste sites in the US (6). **Chromosomal and other major anomalies (facial clefts, megacolon, renal dysplasias) were found in a study of 70 incinerators in France.**

Asthma and Respiratory Disorders

Incinerators produce vast amounts of fine particulates. Particulate pollution has been shown to increase the incidence of asthma in children (7,8), to reduce immunity (9,10,11), to be associated with higher rates of ear, nose and throat infections (7), increased frequency of respiratory symptoms (12,13), increased duration of infections (14), loss of time from school (16) and significant permanent reduction in peak flow from fibrosis with progressive declines in respiratory function (16,17). The greatest declines have been shown to occur in those who spend more time outdoors. **Similarly with asthma the greatest effect is on children who do outdoor sports who have a threefold increase (compared to no increase in unpolluted areas) (18).**

Other Illness

The Sint Niklaas study **showed an excess of autism, hyperactivity, allergies, asthma, repeated infections and congenital defects. Data from this country shows increased autism rates near incinerators: being 1 in 85 near the Edmonton incinerator and 1 in 30 in parts of Birmingham sandwiched between two incinerators (Tysley and Dudley). Average in UK 1 in 180.**

Effects on the Foetus

Chemicals and pollutants that the mother is exposed to during her lifetime will build up in her fatty tissues and in pregnancy these will be actively transported across the placenta into the tiny body of the foetus. **Foetuses have virtually no protection against toxic chemicals as they have no fat stores.** They store them in the only fatty tissue they have: the brain and nervous system. During the first 12 weeks of life the foetus will be affected by miniscule amounts of chemicals, particularly oestrogenic chemicals and these can be neurotoxic and lead to behavioural disorders (19). Small amounts of PCBs and dioxins can affect neurological development, sexual development of the brain and cause altered expression of genes (20) and alter thyroid status (19,21). These chemicals can affect immunity and be associated with high incidences of middle ear infections and recurrent respiratory infections (22).

Breast Feeding

The situation with breast feeding is already extremely serious as it is known that 90% of samples contain about 350 chemicals. **This is higher in industrialised areas showing that inhalation of toxic substances is important (23). The daily dose of toxic substances taken in from breast-feeding can be 50 times greater than that taken in by an adult (24).** This has been shown to affect neurological development (25). Sadly breast-feeding is one of the few effective ways of reducing the mother's toxic load. *There is no question that an incinerator would add to this already dangerous chemical load and there is no justification for this as safe technology exists for waste disposal.*

The Next Generation

It has been clearly demonstrated in animal studies that chemicals can cause cancer in not only the exposed animals but also its offspring for several generations (26). We now know that both chemicals and heavy metals can form DNA adducts and these can be passed on to the foetus. This is very worrying scenario and demonstrates the importance of the precautionary principle and avoiding further pollution.

- 1) www.milieugezondheid.be
- 2) Int J Epidemiol 2000;29(3):391-7
- 3) J Epidemiol Community Health 2003;57(6): 456-61
- 4) Chemosphere 2000;40:1263-70
- 5) Lancet 1998;352(9126):417 and 2002;359(9309):320-2
- 6) Int J Hyg Environ Health 2002;205(1-2):19-27
- 7) Am J Resp Critic Care 2002;166(8):1092-8
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- 9) Environ Toxicology 2002;17(3):219-31
- 10) Environ Res 1983;31(1):201-11
- 11) Lancet 1999;353 (9156):859-66
- 12) Environ Health Perspect 2001; 109Sup 3 381-7
- 13) Am Rev respire Dis 1989; 139(3)587-94
- 14) Am Rev Respir Dis 1992;145(1):42-7
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- 16) Am J Respir Care 2000;162 4Pt1:1383-90
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- 19) Environ Health Perspect 1994;102 Sup 2:125-30
- 20) Evol Dev 2003; 5(1):67-75
- 21) Paed Res 1994;36(4):469-73
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- 23) Chemosphere 1994;29(9-11):2327-38
- 24) Environ Health Perspect 1999;107(1):45-51
- 25) Environ Health Perspect 2003;111(10):357-76
- 26) Int J Cancer 1969;4:219-25

http://www.heraldscotland.com/mobile/news/environment/cancer-fears-threaten-incinerator-plan.18210277?_40e1cb2028cd0e9d896c25d22f83cbc57fe712ba

Cancer fears threaten incinerator plan Published on 22 July 2012

EXCLUSIVE by Rob Edwards Environment Editor

A SERIES of highly toxic emissions from Scotland's newest waste incinerator in breach of safety limits are threatening to upset plans to build similar controversial plants across the country.

An energy-from-waste plant at Dargavel in Dumfries has had its operations restricted by the Scottish Environment Protection Agency (Sepa) after it admitted releasing cancer-causing dioxins up to two-and-a-half times permitted levels into the air. The company that runs the plant, Scotgen, is now facing difficulties obtaining a pollution permit for a second waste incinerator at Dovesdale Farm, near Stonehouse in South Lanarkshire. This proposal has prompted 24,000 objections from local residents and others concerned about the health risks. Before the plant was shut down in April 2011, it suffered some 200 breaches of emission limits, two of which were because of dioxins. According to Sepa, it also had 100 "short-term exceedances" and prompted 45 noise complaints. Problems began again soon after the plant was restarted towards the end of March this year. On May 29, it emitted 0.25 nanograms of dioxins. The permitted limit is 0.1 nanograms.

Sepa ordered that the offending boiler be closed down while the breach was investigated. During trials in June there were a further two dioxin breaches. After further investigations, the plant was allowed to restart last week. Dioxins are a group of highly dangerous and persistent pollutants produced by combustion. As well as triggering cancer, according to the World Health Organisation they can cause reproductive and developmental problems and damage the immune system.

<http://www.macaudailytimes.com.mo/macau/36605-cuhk-to-start-10-year-plan-on-ka-ho-residents%E2%80%99-health.html>

Home | Macau | CUHK to start 10-year plan on Ka Ho residents' health in Macau

CUHK to start 10-year plan on Ka Ho residents' health (Macau)

18/06/2012 10:05:00

The government has commissioned the Chinese University of Hong Kong for a 10-year study of health conditions of the residents in Ka Ho, where local people complained of illness due to the air pollution from ashes from the nearby incinerator. The Health Bureau said they had agreed with the university on the detailed procedures of the study to monitor the health conditions of residents in the area near Hac Sa. The University was quoted as saying details of the monitoring mechanism and study methodologies would be disclosed to the public next month. Preliminary arrangements require an annual report to be published, but the final conclusion will be ten years away. The Health Bureau said the study will be conducted scientifically, impartially and independently in a professional manner. The health issues were discovered early last year when hundreds of residents, many of them students and teachers in the schools there, complained of lung and respiratory problems after the contractor working the incinerator was found to have broken safety regulations by disposing of the ashes into open areas, and a large amount of them carried to residential districts by wind

IMPERIAL COLLEGE UK STUDY

Sent: Monday, January 30, 2012 19:05

To: ‘dynamco@netvigator.com’; ‘chair@cleartheair.org.hk’

Cc: Andrew Tristem; ‘Frances Pollitt’; ‘Kelly, Frank’; Elliott, Paul

Subject: FW: Incinerator study

Dear Mr Middleton

Thank you for your enquiry on behalf of ‘Clear The Air’ in Hong Kong.

The English Health Protection Agency announced last week that they have approved funding for a Small Area Health Statistics Unit study to investigate whether there is any potential link between municipal waste incinerators and reproductive health - see

<http://www.hpa.org.uk/NewsCentre/NationalPressReleases/2012PressReleases/120124Incineratorstudystatement/>

This is for a two year study starting in April 2012. Results will be made publicly available once accepted for publication in a peer-reviewed journal.

Best wishes

Anna Hansell

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<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2074344/>

Cancer incidence near municipal solid waste incinerators in Great Britain.

[P. Elliott](#), [G. Shaddick](#), [I. Kleinschmidt](#), [D. Jolley](#), [P. Walls](#), [J. Beresford](#), and [C. Grundy](#)

[Author information](#) ► [Copyright and License information](#) ►

This article has been [cited by](#) other articles in PMC.

Abstract

By use of the postcoded database held by the Small Area Health Statistic Unit, cancer incidence of over 14 million people living near 72 municipal solid waste incinerators in Great Britain was examined from 1974-86 (England), 1974-84 (Wales) and 1975-87 (Scotland). Numbers of observed cases were compared with expected numbers calculated from national rates (regionally adjusted) after stratification by a deprivation index based on 1981 census small area statistics. **Observed-expected ratios were tested for decline in risk with distance up to 7.5 km. The study was conducted in two stages: the first involved a stratified random sample of 20 incinerators; the second the remaining 52 incinerators. Over the two stages of the study was a statistically significant ($P<0.05$) decline in risk with distance from incinerators for all cancers combined, stomach, colorectal, liver and lung cancer.** Among these cancers in the second stage, the excess from 0 to 1 km ranged from 37% for liver cancer (0.95) excess cases 10(-5) per year to 5% for colorectal cancer. There was evidence of residual confounding near the incinerators, which seems to be a likely explanation of the finding for all cancers, stomach and lung, and also to explain at least part of the excess of liver cancer. For this reason and because of a substantial level of misdiagnosis (mainly secondary tumours) found among registrations and death certificates for liver cancer, further investigation, including histological review of the cases, is to be done to help determine whether or not there is an increase in primary liver cancer in the vicinity of incinerators.

[Br J Cancer](#). 2000 Mar;82(5):1103-6.

Cancer incidence near municipal solid waste incinerators in Great Britain. Part 2: histopathological and case-note review of primary liver cancer cases. [Elliott P](#), [Eaton N](#), [Shaddick G](#), [Carter R](#).

Source

Small Area Health Statistics Unit, Imperial College School of Medicine, St. Mary's Campus, London, UK.

Abstract

We reported previously a 37% excess risk of liver cancer within 1 km of municipal incinerators. Of 119/235 (51%) cases reviewed, primary liver cancer was confirmed in 66 (55%) with 21 (18%) definite secondary cancers. **The proportions of true primaries ranging between 55% and 82% (i.e. excluding secondary cancers) give revised estimates of between 0.53 and 0.78 excess cases per 10(5) per year within 1 km.**

PMID:

10737393

[PubMed - indexed for MEDLINE]

PMCID: PMC2374434

[J Epidemiol](#). 2004 May;14(3):83-93. <http://www.ncbi.nlm.nih.gov/pubmed/15242064>

Risk of adverse reproductive outcomes associated with proximity to municipal solid waste incinerators with high dioxin emission levels in Japan.

[Tango T](#), [Fujita T](#), [Tanihata T](#), [Minowa M](#), [Doi Y](#), [Kato N](#), [Kunikane S](#), [Uchiyama I](#), [Tanaka M](#), [Uehata T](#).

Source

Department of Technology Assessment and Biostatistics, National Institute of Public Health, Wako, Saitama, Japan.

Abstract

BACKGROUND:

Great public concern about health effects of dioxins emitted from municipal solid waste incinerators has increased in Japan. This paper investigates the association of adverse reproductive outcomes with maternal residential proximity to municipal solid waste incinerators.

METHODS:

The association of adverse reproductive outcomes with mothers living within 10 km from 63 municipal solid waste incinerators with high dioxin emission levels (above 80 ng international toxic equivalents TEQ/m³) in Japan was examined. The numbers of observed cases were compared with the expected numbers calculated from national rates adjusted regionally. Observed/expected ratios were tested for decline in risk or peak-decline in risk with distance up to 10 km.

RESULTS:

In the study area within 10 km from the 63 municipal solid waste incinerators in 1997-1998, 225,215 live births, 3,387 fetal deaths, and 835 infant deaths were confirmed. None of the reproductive outcomes studied here showed statistically significant excess within 2 km from the incinerators. However, a statistically significant peak-decline in risk with distance from the incinerators up to 10 km was found for infant deaths ($p=0.023$) and infant deaths with all congenital malformations combined ($p=0.047$), where a "peak" is detected around 1-2 km.

CONCLUSION:

Our study shows a peak-decline in risk with distance from the municipal solid waste incinerators for infant deaths and infant deaths with all congenital malformations combined. However, due to the lack of detailed exposure information to dioxins around the incinerators, the observed trend in risk should be interpreted cautiously and there is a need for further investigation to accumulate good evidence regarding the reproductive health effects of waste incinerator exposure.

PMID: 15242064 [PubMed - indexed for MEDLINE]

[Occup Environ Med.](http://www.ncbi.nlm.nih.gov/pubmed/20581259) 2010 Jul;67(7):493-9. doi: 10.1136/oem.2009.052456.
<http://www.ncbi.nlm.nih.gov/pubmed/20581259>

Maternal residence near municipal waste incinerators and the risk of urinary tract birth defects.

[Cordier S](#), [Lehébel A](#), [Amar E](#), [Anzivino-Viricel L](#), [Hours M](#), [Monfort C](#), [Chevrier C](#), [Chiron M](#), [Robert-Gnansia E](#).

Source INSERM U625, Université Rennes I, Campus de Beaulieu, Rennes Cedex, France.
sylvaine.cordier@rennes.inserm.fr

Abstract OBJECTIVES:

Waste incineration releases a mixture of chemicals with high embryotoxic potential, including heavy metals and dioxins/furans, into the atmosphere. In a previous ecological study we found an association between the risk of urinary tract birth defects and residence in the vicinity of municipal solid waste incinerators (MSWIs). The objective of the present study was to specifically test this association.

METHODS: A population-based case-control study compared 304 infants with urinary tract birth defects diagnosed in the Rhône-Alpes region (2001-2003) with a random sample of 226 population controls frequency-matched for infant sex and year and district of birth. Exposure to dioxins in early pregnancy at the place of residence, used as a tracer of the mixture released by 21 active waste incinerators, was predicted with second-generation Gaussian modelling (ADMS3 software). Other industrial emissions of dioxins, population density and neighbourhood deprivation were also assessed. Individual risk factors including consumption of local food were obtained by interviews with 62% of the case and all control families.

RESULTS: Risk was increased for mothers exposed to dioxins above the median at the beginning of pregnancy (OR 2.95, 95% CI 1.47 to 5.92 for dioxin deposits). When only interviewed cases were considered, risk estimates decreased mainly because the non-interviewed cases were more likely to live in exposed residential environments (OR 2.05, 95% CI 0.92 to 4.57). The results suggest that consumption of local food modifies this risk.


CONCLUSIONS:

This study confirms our previous observation of a link between the risk of urinary tract birth defects and exposure to MSWI emissions in early pregnancy and illustrates the effect of participation bias on risk estimates of environmental health impacts.

The Lancet, [Volume 355, Issue 9218](#), Pages 1858 - 1863, 27 May 2000

doi:10.1016/S0140-6736(00)02290-X [Cite or Link Using DOI](#)

Paternal concentrations of dioxin and sex ratio of offspring

Prof [Paolo Mocarelli MD a](#) , [Pier Mario Gerthoux PhD a](#), [Enrica Ferrari PhD a](#), [Donald G Patterson PhD b](#), [Stephanie M Kieszak MA c](#), [Paolo Brambilla MD a](#), [Nicoletta Vincoli PhD a](#), [Stefano Signorini MD a](#), [Pierluigi Tramacere MD a](#), [Vittorio Carreri MD d](#), [Eric J Sampson PhD b](#), [Wayman E Turner MS b](#), [Larry L Needham PhD b](#) [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(00\)02290-X/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(00)02290-X/fulltext)

Summary

Background 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD or dioxin), is commonly considered the most toxic man-made substance. We have previously shown that high serum concentrations of TCDD in parents from Seveso, Italy, were linked to their having a relative increase in the number of female births after the parents exposure to a release of dioxin in 1976. We have continued the study to determine whether the parents' sex and/or age at exposure affected the sex ratio of their children.

Methods We measured the TCDD concentrations in serum samples from potentially exposed parents collected in 1976 and 1977, and investigated the sex ratio of their offspring.

Findings Serum samples were collected from 239 men and 296 women. 346 girls and 328 boys were born to potentially exposed parents between 1977 and 1996, showing an increased probability of female births (lower sex ratio) with increasing TCDD concentrations in the serum samples from the fathers ($p=0.008$). This effect starts at concentrations less than 20 ng per kg bodyweight. Fathers exposed when they were younger than 19 years of age sired significantly more girls than boys (sex ratio 0.38 [95% CI 0.30–0.47]).

Interpretation Exposure of men to TCDD is linked to a lowered male/female sex ratio in their offspring, which may persist for years after exposure. The median concentration of dioxin in fathers in this study is similar to doses that induce epididymal impairments in rats and is about 20 times the estimated average concentration of TCDD currently found in human beings in industrialised countries. **These observations could have important public-health implications.**

Incinerators double childhood cancer

<http://www.greenpeace.org.uk/toxics/incinerators-double-childhood-cancer>

Between 1974 and 1987, twice as many children who lived within 5km of incinerators in the UK died from cancer, compared to those who lived further away, according to new research published in the International Journal of Epidemiology.(1)

The study comes on top of others which have found significant increases in cancers, of both adults and children, around incinerators(2) (3). However, because incinerators are often sited in industrial or deprived areas, scientists have been unable to say for sure that it is the toxins from burning mixed waste that are causing these extra cancers. Other industrial pollution or lifestyle factors, such as a poor diet, could be to blame, they say.

But the latest study found that there was no increase in cancer around "non-combustion" sites such as football grounds and biscuit makers. This appears to rule out social factors such as diet. Cancers around hospital incinerators were at similar levels to those around municipal waste incinerators, indicating that incineration could be the common cause. This led the author of the report, Professor George Knox of Birmingham University, to conclude that while nearby sources of industrial pollution might also contribute, the incinerators were "probably carcinogenic".

The study was based on detailed examination of childhood deaths from cancer around 72 municipal and 307 hospital waste incinerators. Most of the incinerators studied have now been closed and those that remain are subject to tighter controls. However, even the most modern incinerators emit substances known to cause cancer as well as heavy metals and ultra-fine dust particles which can have a range of other health effects. Despite this the Government continues to insist on building new incinerators.

(1) International Journal of Epidemiology, 2000; 29:391-397 (2) Elliot P, Shaddick G, Kleinschmidt I et al Cancer incidence near municipal solid waste incinerators in Great Britain, British Journal of Cancer 1996; 73:702-10 (3) Elliot p, Eaton N, Shaddick G, Carter R, Cancer incidence near municipal solid waste incinerators in Great Britain. Part 2:histopathological and case-note review of primary liver cancer cases, British Journal of Cancer 2000, 82(5), 1103-1106

<http://www.guardian.co.uk/environment/2000/may/18/pollution.uknews>

Incinerator cancer threat revealed

Dioxins from waste burning and industry far more dangerous than was thought

[Sarah Boseley](#), [John Vidal](#) and [Julian Borger](#) in Washington

[The Guardian](#), Thursday 18 May 2000 02.34 BST

Dioxins, the highly toxic chemicals produced by waste incineration and industrial processes which tests have shown to be lingering in the bodies of people all over the planet, have been identified as the cause of many cancers in a new report from the US Environmental Protection Agency.

A draft of the EPA report, leaked yesterday to the Washington Post, has taken the US by surprise and is likely to send shockwaves throughout the rest of the world, forcing an upgrade in the assessment of the hazard posed by dioxins. It had been thought that the risk was diminishing because levels of the chemicals in the environment were dropping.

The report will fuel mounting opposition in communities across Britain to a new generation of up to 160 major waste incinerators that the government is expected to encourage over the next 20 years.

Dioxins are chemical compounds unintentionally released by incinerators burning sewage sludge and household, hazardous and medical waste. They are also released in industrial processes such as steel making.

Among the most poisonous man-made chemicals, they accumulate in fat and milk and work their way up the food chain. Even low-level exposure is known to interfere with the immune, reproductive and endocrine systems. The latter is involved in the secretion of hormones. Dioxins also effect the early growth and development of humans and animals.

By far the greatest dioxin producer in Britain, according to the Environment Agency, is British Steel, whose works at Llanwern, Port Talbot, Scunthorpe and Teesside pump out almost as many dioxins as the next 15 most polluting companies.

That dioxins are already widely present in the environment and food supplies of all industrialised countries is well-known, but evidence has been slowly accumulating about how widespread and carcinogenic some are. Yesterday's EPA report is remarkably similar to a more low key report from a group of German scientists, which last year concluded that dioxins might be responsible for 12% of human cancers in industrialised countries.

The British government is gradually accepting that dioxins pose real health threats.

In 1994, the Department of Health published a report saying that "despite insufficient evidence for clear causal links", it would be prudent to regard dioxins as possible human carcinogens".

Health hazard

The proposed incineration plants will be needed, it is claimed, to handle the growing mountains of household waste that the EU is banning from landfill sites. In response to the EU directive, the government is expected to announce that by 2020 it will recycle a third of household waste and burn a third.

Some communities are already arguing that these incinerators will pose a health hazard and that money should be spent on more expensive recycling and composting schemes.

Such alternatives, say Friends of the Earth, would be popular, provide more jobs and be easy for people to understand. They say that £250m collected yearly in waste tax could be used to build new recycling centres.

Chris Pilbury, who works with a coalition of 25 community groups in north-east Wales that oppose a massive proposed incinerator and cement kiln expansion scheme near Wrexham, said: "People will not tolerate these risks. Feelings are running high and this report confirms that we are right to be concerned."

The document, nine years in preparation, says that for those who eat large amounts of fatty meat and dairy produce the risk - on top of any others they may be exposed to - of getting cancer could be as high as one in 100.

Yesterday the EPA said that at least one scientist involved disputed the statistic and that there was a possibility it would be amended before official publication in June. But there will be no dilution of the message of acute concern about dioxins in the report, which for the first time names the most toxic of the group, TCDD (the infamous Agent Orange of Vietnam) as a human carcinogen.

In 1997, the International Agency for Research on Cancer (IARC) categorised TCDD as a "known human carcinogen" after analysing the epidemiological evidence. In 1998, the World Health Organisation decided to slash the safe level for human exposure. Even at the new level of between one and four picograms per kilogram of body weight (a picogram is a millionth of a millionth of a gram) - they were still anxious that "subtle effects may already occur in the general population in developed countries".

Cancer is not the only worry, and other health damage from dioxins has been slightly easier to substantiate. The EPA report will link low-grade dioxin exposure to a variety of problems, including hormonal changes and developmental defects in babies. It states: "It is likely that part of the general population is at, or near, exposure levels where adverse effects can be anticipated."

Risk to babies

Rick Hind, the legislative director for Greenpeace's toxics campaign, which yesterday wrote to the EPA demanding a Dioxin emergency action plan, said: "This means that dioxin levels in the bodies of newborn babies are already at levels that put them at risk of serious illness."

There have been concerns for some time about the high levels of dioxins in human breast milk, although environmental and health groups continue to urge women that the risks do not outweigh the benefits of breastfeeding.

Experts from the Imperial Cancer Research Fund (ICRF) and the Cancer Research Campaign (CRC) in London yesterday agreed that dioxins were a cause of anxiety.

"We know that dioxins are in general highly toxic and can cause cancer," said Tim Key of the ICRF cancer epidemiology unit in Oxford. But more is unknown than known.

"The whole area is full of uncertainty and particularly in relation to cancer," said Lesley Walker of the CRC

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Occurrence and profiles of chlorinated and brominated polycyclic aromatic hydrocarbons in waste incinerators.

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Source

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Abstract

Chlorinated polycyclic aromatic hydrocarbons (CIPAHs) have been reported to occur in urban air. Nevertheless, sources of CIPAHs in urban air have not been studied, due to the lack of appropriate analytical methods and standards. In this study, we measured concentrations of 20 CIPAHs and 11 brominated PAHs (BrPAHs) in fly ash and bottom ash from 11 municipal/hazardous/industrial waste incinerators, using analytical standards synthesized in our laboratory. Concentrations of total CIPAHs and BrPAHs in ash samples ranged from <0.06 to 6990 ng/g and from <0.14 to 1235 ng/g, respectively. The concentrations of CIPAHs were approximately 100-fold higher than the concentrations of BrPAHs. 6-CIBaP and 1-CIPyr were the dominant compounds in fly ash samples. The profiles of halogenated PAHs were similar to the profiles reported previously for urban air. 1-BrPyr was the predominant BrPAH in fly ash. Concentrations of 6-CIBaP, 9,10-Cl2Phe, 9-ClAnt, and 6-BrBaP in fly ash were significantly correlated with the corresponding parent PAH concentrations. Significant correlation between sigmaCIPAH and sigmaPAH concentrations suggests that direct chlorination of parent PAHs is the mechanism of formation of CIPAHs during incineration of wastes; nevertheless, a comparable correlation was not found for BrPAHs. There was no significant correlation between the capacity and temperature of an incinerator and the concentrations of sigmaCl-/BrPAHs in ash samples, although lower concentrations of all halogenated PAHs were found in stoker-type incinerators than in fixed grate-type incinerators. Toxicity equivalency quotients (TEQs) for CIPAHs in ash samples were calculated with CIPAH potencies. Average TEQ concentrations of CIPAHs in fly ash and bottom ash were 15800 pg-TEQ/g and 67 pg-TEQ/g, respectively. **Our results suggest that the extent of dioxin-like toxicity contributed by CIPAHs in ash generated during waste incineration is similar to that reported previously for dioxins. Waste incineration is an important source of Cl-/BrPAHs in the urban atmosphere.**
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